Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

Centre Number | | | | | |

Candidate Number | | | | |

Monday 11 November 2019

Afternoon (Time: 1 hour 30 minutes) | Paper Reference **1MA1/3F**

Mathematics

Paper 3 (Calculator)
Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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6/1/1/

P 5 8 8 7 5 A 0 1 2 4

Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write down two factors of 12

factors = numbers that go into 12

$1 \times 12 = 12$
$2 \times 6 = 12$
$3 \times 4 = 12$

1 , 2

(Total for Question 1 is 1 mark)

2 Find $\frac{1}{3}$ of 30

$= \frac{1}{3} \times 30 = \frac{30}{3} = 10$

10

(Total for Question 2 is 1 mark)

3 Write 0.7 as a fraction.

= 7 in tenths column $= \frac{7}{10}$

$\frac{7}{10}$

(Total for Question 3 is 1 mark)

4 Here is a list of numbers.

7 8 15 16 18 22

Write down the number from the list that is a multiple of 6

multiple of 6 = number in 6 times table

$3 \times 6 = 18$

18

(Total for Question 4 is 1 mark)

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5 Change 4 kilometres into metres.

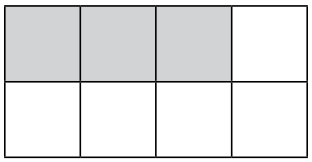
4 × 1000

km → m
× 1000

4000 metres

(Total for Question 5 is 1 mark)

6 Here is a grid of squares.



Write down the ratio of the number of shaded squares to the number of unshaded squares.

3 shaded : 5 unshaded

3 : 5

(Total for Question 6 is 1 mark)

7 $w = 4u + 3$

Find the value of w when $u = 8$

$w = 4(8) + 3$

$w = 32 + 3$

$= 35$

35

(Total for Question 7 is 2 marks)

8 Here are the first five terms of a sequence.

1 (+2) 3 (+3) 6 (+4) 10 (+5) 15 (+6) — (+7)

Write down the next two terms of the sequence.

15 + 6 = 21

21 + 7 = 28

21 , 28

(Total for Question 8 is 2 marks)

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9 Mrs Brown asked each child in her class which pet they liked best.

Here are her results.

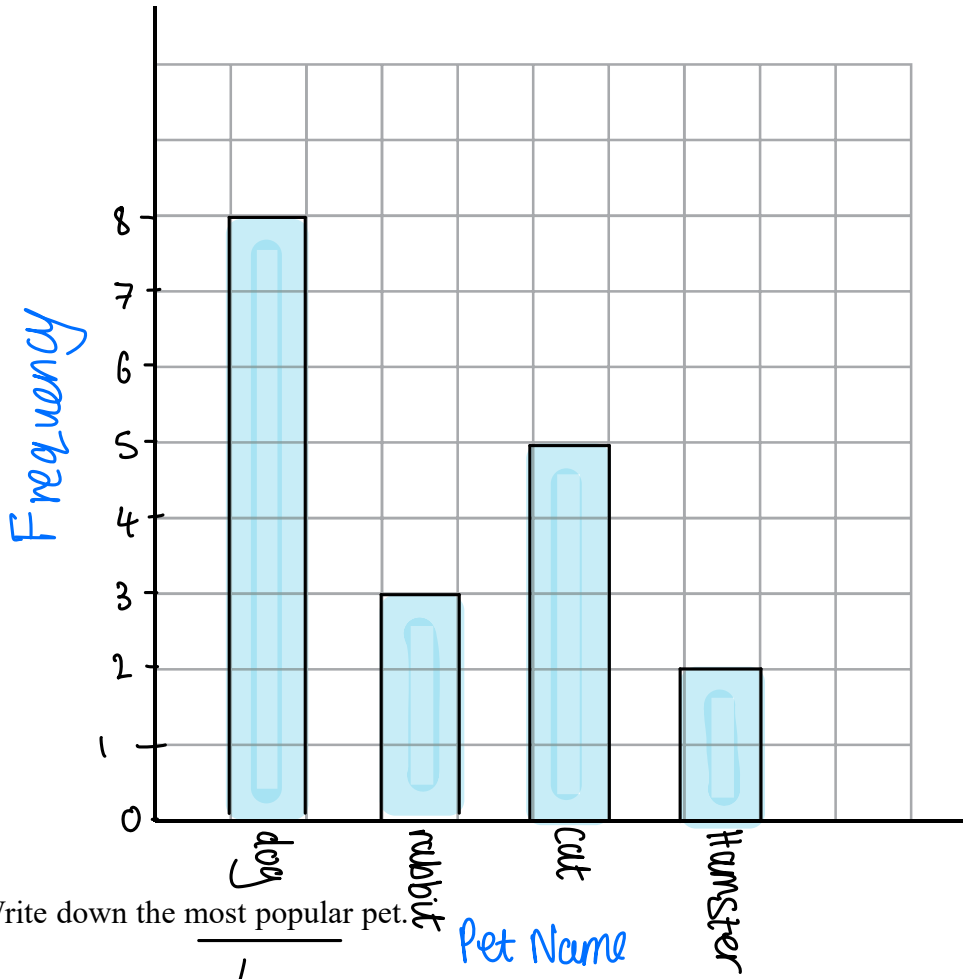
dog	rabbit	cat	dog	dog	hamster
cat	dog	rabbit	hamster	cat	cat
dog	dog	cat	dog	rabbit	dog

(a) Complete the frequency table for this information.

Pet	Tally	Frequency
dog	𝍸 III	8
rabbit	III	3
cat	𝍸	5
hamster	II	2

(2)

(b) On the grid below, draw a bar chart for this information.



(3)

(c) Write down the most popular pet.

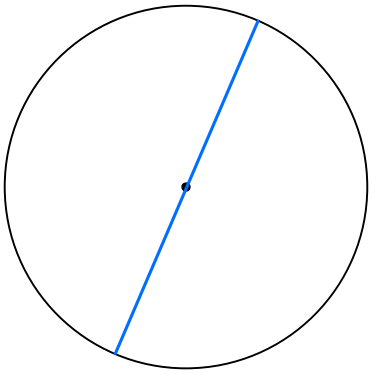
Dog

highest frequency

(1)

(Total for Question 9 is 6 marks)

10



joins two points on the circumference and passes through the centre.

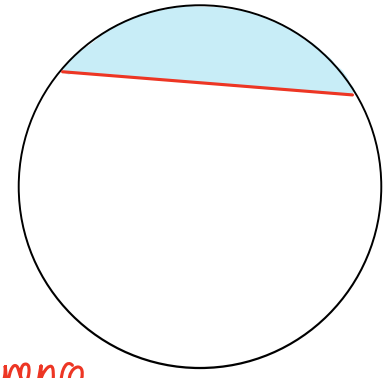
(a) On the diagram above, draw a diameter of the circle.

(1)

(b) On the diagram below, draw a segment of the circle.
Shade the segment.

Region bounded by chord and arc

Straight line joining any two points on the circumference



(1)

(Total for Question 10 is 2 marks)

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11 Dylan buys 13 bicycle lights for £7.50 each.
He pays with five £20 notes.

(a) How much change should Dylan get?

13 lights cost: $13 \times 7.50 = £97.50$

Dylan pays: $£20 \times 5 = £100$

Change: $100 - 97.50 =$

£ 2.50

(3)

The normal price of a bicycle is £120

In a sale, there is $\frac{1}{5}$ off the normal price of the bicycle.

(b) Work out the price of the bicycle in the sale.

Sale price = $\frac{1}{5}$ off of £120.

$\frac{1}{5}$ of 120: $\frac{1}{5} \times 120 = £24$

$120 - 24 = 96$

£ 96

(2)

(Total for Question 11 is 5 marks)

12 Cornflakes are sold in two sizes of box.

Size of box	Weight of cornflakes
small	450 g
large	750 g

Rae buys 3 small boxes of cornflakes and some large boxes of cornflakes.
In total she buys 5850 g of cornflakes.

Work out the number of large boxes of cornflakes Rae buys.

x = number of large boxes

set up an equation

$450 \times 3 + 750 \times x = 5850\text{g}$

$1350 + 750x = 5850$

-1350

$750x = 4500$

$\div 750$

$x = 6$

6

(Total for Question 12 is 3 marks)

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13 The stem and leaf diagram below gives information about the ages of people in a social club.

3	1	4	5			
4	0	2	2	5	6	
5	0	1	7	7	8	9
6	3	4	5	9		
7	0	4				

Key: 4|2 represents 42 years

Find the range of these ages.

74 − 31 =

biggest − smallest

714 = 74

311 = 31

43 ..... years

(Total for Question 13 is 2 marks)

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14 Here is a rectangle.

Coby has to find the perimeter of this rectangle.

He writes,

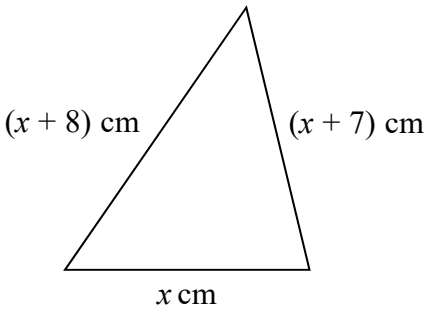
Perimeter = 7×3

(a) What mistake has Coby made?

Coby has found the area. The perimeter is the total length of the sides. The perimeter is $7+3+7+3 = 20$cm

(1)

Here is a triangle.



Iram solves a problem about this triangle to find the value of x.

Her answer is

$x = -2$

(b) Explain why Iram's answer must be wrong.

Because a side length can't be a negative value. The length must be positive, and therefore x must be more than zero

(1)

(Total for Question 14 is 2 marks)

15 There are 800 students at a school.
Each student has either a school dinner or a packed lunch.

31% of the students have packed lunches.

55% of the students are boys.
60% of the boys have school dinners.

How many girls have packed lunches?
You must show all your working.

	Boys	Girls	Total
school dinners	60% of 440 0·6 × 440 264		
packed lunch	440 − 264 176	248 − 176 72	31% of 800 0·31 × 800 248
total	55% of 800 0·55 × 800 = 440	800 − 440 360	800

72

(Total for Question 15 is 4 marks)

16 In a bag there are only red counters, blue counters, green counters and yellow counters.
A counter is taken at random from the bag.

The table shows the probabilities of getting a red counter or a yellow counter.

Colour	red	blue	green	yellow
Probability	0.4	0.15	0.2	0.25

the number of blue counters : the number of green counters = 3 : 4

4 parts → 4x
3 parts → 3x

Complete the table.

Probability adds up to 1

$0.4 + 3x + 4x + 0.25 = 1$

$0.65 + 7x = 1$

$7x = 0.35$

$\div 7$

$x = 0.05$

$3x = 0.15$ (3 × 0.05)

$4x = 0.2$ (4 × 0.05)

(Total for Question 16 is 4 marks)

17 (a) Complete the table of values for $y = 4x - 6$

x	−1	0	1	2	3	4
y	−10	−6	−2	2	6	10

$y = 4x - 1 - 6$
$= -4 - 6$
$= -10$

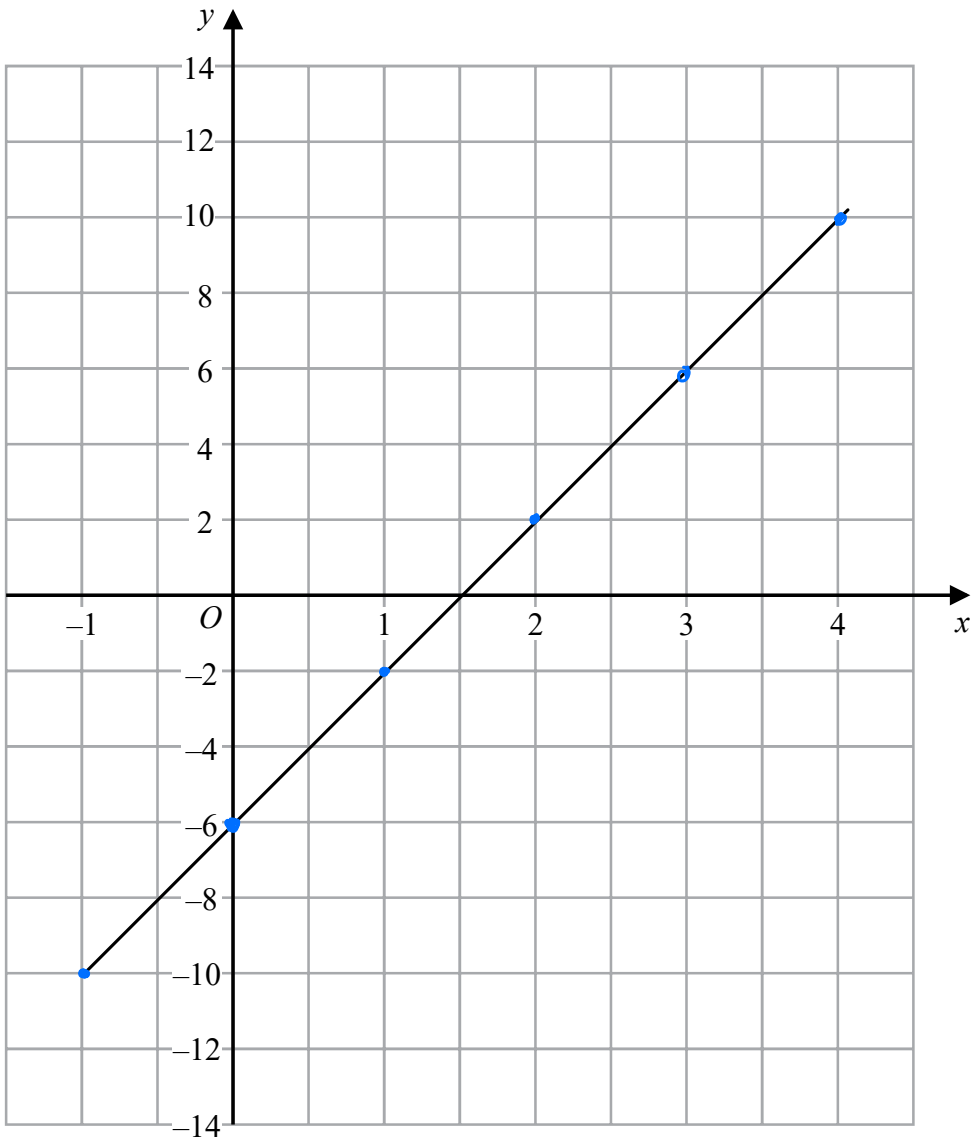
$y = 4 \times 0 - 6$
$= -6$

$y = 4 \times 2 - 6$
$= 2$

$y = 4 \times 3 - 6$
$= 6$

(2)

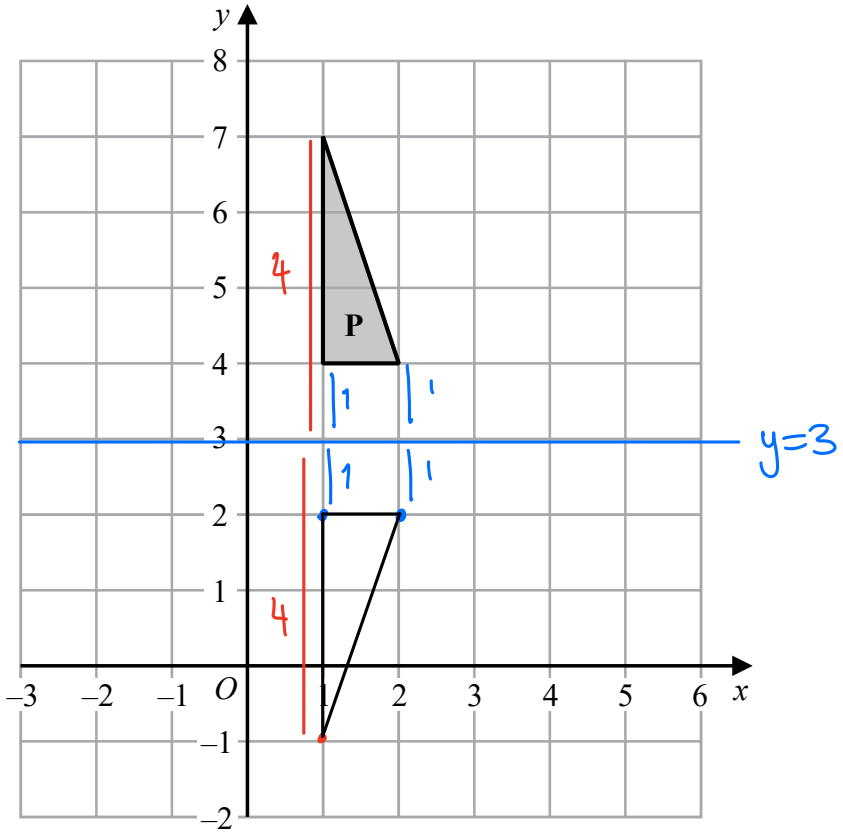
(b) On the grid, draw the graph of $y = 4x - 6$ for values of x from −1 to 4



(2)

(Total for Question 17 is 4 marks)

18



Reflect shape **P** in the line $y = 3$

(Total for Question 18 is 2 marks)

19 Solve $4(x - 6) = 44$

$4(x-6) = 44$

$\div 4$

$x - 6 = 11$

$+6$

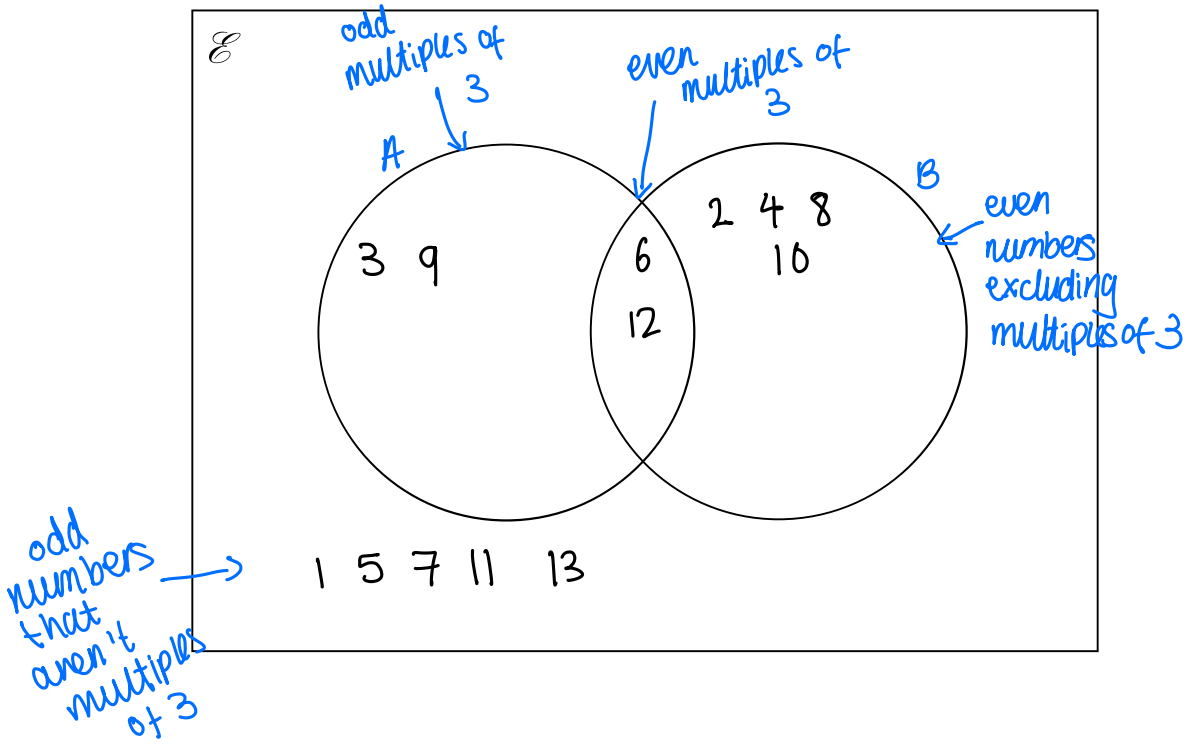
$x = 17$

$x =$ 17

(Total for Question 19 is 2 marks)

20 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$
$A = \{\text{multiples of } 3\}$
$B = \{\text{even numbers}\}$

Complete the Venn diagram for this information.



(Total for Question 20 is 4 marks)

21 Franco buys a house for £146 500
He sells the house for £158 220

Calculate the percentage profit Franco makes.

$$\text{Profit} = \frac{\text{new} - \text{original}}{\text{original}} \times 100$$

$$= \frac{158\,220 - 146\,500}{146\,500} \times 100$$

$$= \frac{11720}{146\,500} \times 100$$

$$= 0.08 \times 100$$

8 %

(Total for Question 21 is 3 marks)

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22 (a) Expand and simplify $(x + 5)(x - 9)$

$x^2 - 9x + 5x - 45$

-9×5

simplify

$x^2 - 4x - 45$

(2)

(b) Factorise fully $9x^2 + 6x$

$3x$ is the highest common factor

$3x(3x + 2)$

$9x^2 \div 3x$

$6x \div 3x$

$3x(3x+2)$

(2)

(Total for Question 22 is 4 marks)

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23 (a) Use your calculator to work out $\dfrac{29^2 - 4.6}{\sqrt{35 - 1.9^3}}$

Write down all the figures on your calculator display.

$= \dfrac{841 - 4.6}{\sqrt{28.141}} = \dfrac{836.4}{5.304809...}$

$= 157.668255$

(2)

(b) Write your answer to part (a) correct to 4 significant figures.

1 2 3 4

157.668

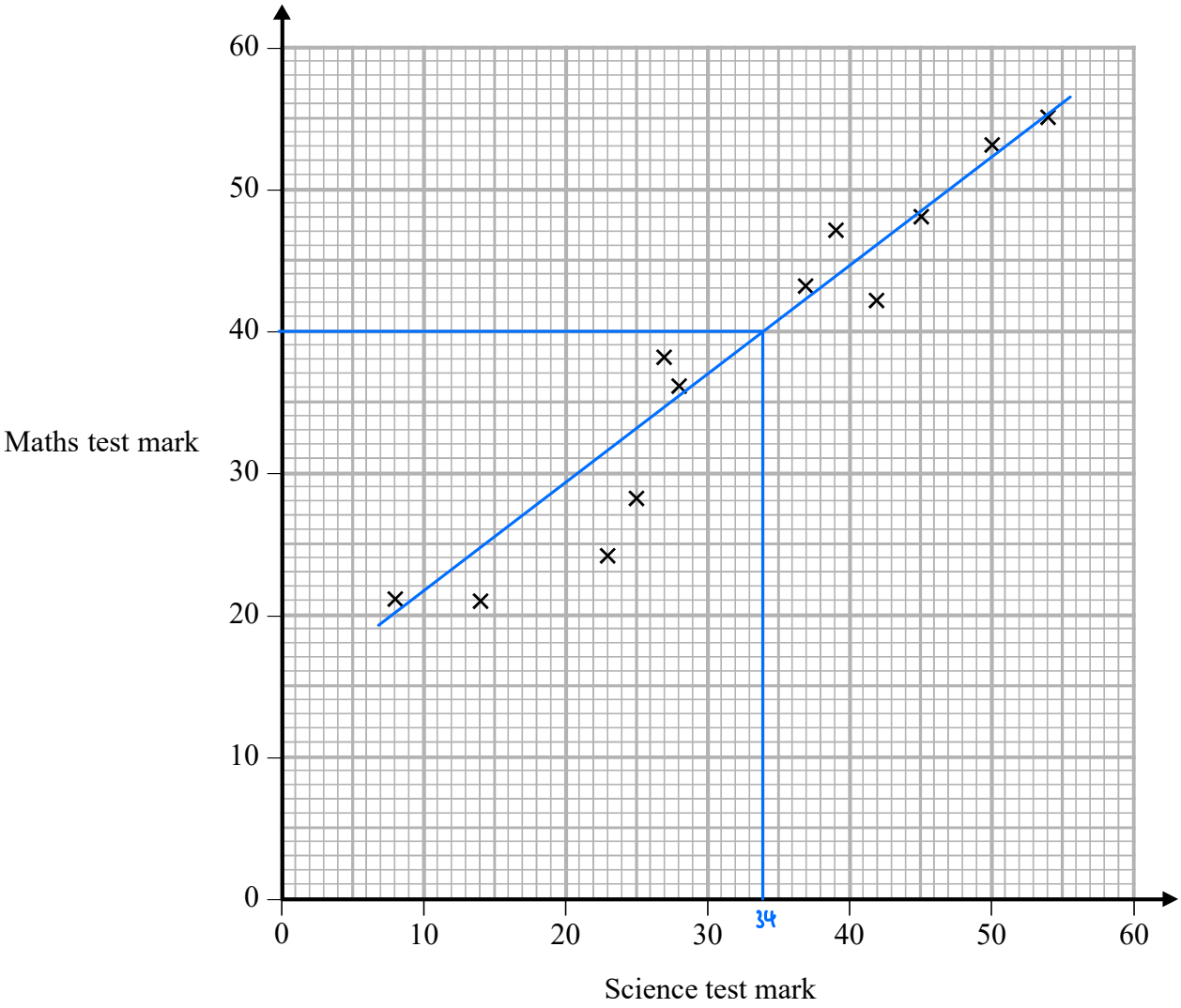
$=$ round up

157.7

(1)

(Total for Question 23 is 3 marks)

24 The scatter graph shows information about the marks a group of students got in a Science test and in a Maths test.



Jamie got a mark of 34 in the Science test.

Using the scatter graph, find an estimate for Jamie's mark in the Maths test.

Draw line of best fit

40

(Total for Question 24 is 2 marks)

25 The table gives information about the times taken, in seconds, by 18 students to run a race.

Time (t seconds)	Frequency	midpoint x	fx
$5 < t \leqslant 10$	1	7·5	7·5
$10 < t \leqslant 15$	2	12·5	25
$15 < t \leqslant 20$	7	17·5	122·5
$20 < t \leqslant 25$	8	22·5	180
	= 18		

Work out an estimate for the mean time.
Give your answer correct to 3 significant figures.

Mean = $\frac{\Sigma fx}{\Sigma f}$

$= \frac{7.5 + 25 + 122.5 + 180}{1 + 2 + 7 + 8} = \frac{335}{18}$

$= 18.611\ldots$

$= 18.6$ (round down)

18·6 seconds

(Total for Question 25 is 3 marks)

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26 Write 37 cm^3 in mm^3

cm $\xrightarrow{\times 10}$ mm

cm^3 $\xrightarrow{\times 10^3}$ mm^3 $\times 1000$

$37 \times 1000 =$

37000 mm^3

(Total for Question 26 is 1 mark)

27 Nimer was driving to a hotel.
He looked at his Sat Nav at 1330

Time	1330
Distance to destination	65 miles

Nimer arrived at the hotel at 1448

$\text{speed} = \frac{\text{distance}}{\text{time}}$

Work out the average speed of the car from 1330 to 1448
You must show all your working.

Time : 13:30 to 14:48 = 1h 18min

= 78min (60 + 18)

= 1.3hours ($\div 60$)

$\text{Speed} = \frac{65 \text{ miles}}{1.3 \text{ hours}} = 50 \text{ mph}$

50 mph

(Total for Question 27 is 4 marks)

28 (a) Write 32 460 000 in standard form.

7 6 5 4 3 2 1

between 1 and 10

3.246×10^7

(1)

(b) Write 4.96×10^{-3} as an ordinary number.

0004.96

3 2 1

0.00496

(1)

Asma was asked to compare the following two numbers.

$A = 6.212 \times 10^8$ and $B = 4.73 \times 10^9$

She says,

"6.212 is bigger than 4.73 so A is bigger than B."

(c) Is Asma correct?
You must give a reason for your answer.

No, because A is only multiplied by 10^8, B is multiplied by 10^9. This means that B would be bigger as B would have more digits than A.

(1)

(Total for Question 28 is 3 marks)

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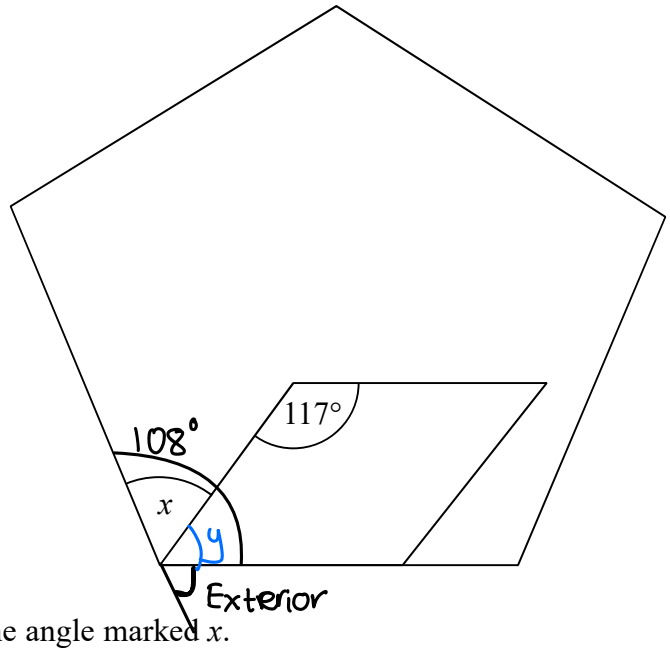
29 The diagram shows a regular pentagon and a parallelogram.



Work out the size of the angle marked x.
You must show all your working.

Exterior angle = $\frac{360}{n}$ Interior + Exterior = 180

Exterior angle of Pentagon (n=5) = $\frac{360}{5}$ = 72°

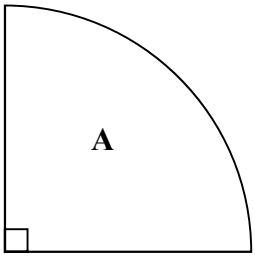
Interior angle = 180 − 72 = 108°

Angle y: 180 − 117 = 63° corresponding angles

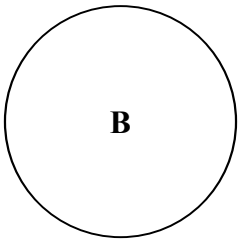
x : 108 − 63 = 45 °

(Total for Question 29 is 4 marks)

30 **A** is in the shape of a quarter circle of radius 15 cm.
B is in the shape of a circle.



15 cm



The area of **A** is 9 times the area of **B**.

Show that the radius of **B** is 2.5 cm.

quarter of a circle

Area of A: $\frac{1}{4} \times \pi \times r^2$

$= \frac{1}{4} \times \pi \times 15^2 = \frac{225}{4}\pi$

Area of B: πr^2 (r is unknown)

Area A is 9 times of B:

$\frac{225}{4}\pi = 9\pi r^2$ equate

$\div 9$

$\frac{25}{4} = r^2$

$\sqrt{\ }$

$\pm 2.5 = r$

radius is always positive

radius of B = 2.5 cm

(Total for Question 30 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS

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